

Sensitivity Runs for defining 2000 BASE Assumptions

**Presented to
ICU Team
by**

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Objective

- To provide information to make decisions on assumptions for the 2000 BASE (pre-CERP baseline) scenario
- Sensitivity runs to see the effects of:
 - Permitted vs. Actual acreages
 - Permitted vs. Actual wellfield demands
 - Implementation of authorized projects and operating criteria
- **These are only sensitivity runs - NOT runs for developing the 2000 BASE scenario**

Key Assumptions

Scenario	LOK Schedule	LEC Demands	Caloos/Istok		Tribal Demands		Authorized Projects
			Method	Acreage	Brighton Seminole	Big Cypress Seminole	
95BSRR (LEC)	WSE	Actual as in LECRWSP	AFSIRS	Actual as of 1995	Average 28,500 ac-ft based on actual data	Blaney-Criddle (Same as in RESTUDY)	None
Permitted 1	WSE	Actual as in LECRWSP	AFSIRS	Permitted as of 1995	Average 28,500 ac-ft based on actual data	Blaney-Criddle (Same as in RESTUDY)	None
Permitted 2	WSE	Permitted as of 1995	AFSIRS	Permitted as of 1995	Average 28,500 ac-ft based on actual data	Blaney-Criddle (Same as in RESTUDY)	None
Authorized	WSE	Permitted as of 1995	AFSIRS	Permitted as of 1995	Average 28,500 ac-ft based on actual data	Blaney-Criddle (Same as in RESTUDY)	ECP, C-111, Modwaters

- * All scenarios use current Rainfall Delivery Formula for ENP deliveries
- * All other assumptions are as modeled in LEC 95BSRR run

Scenarios

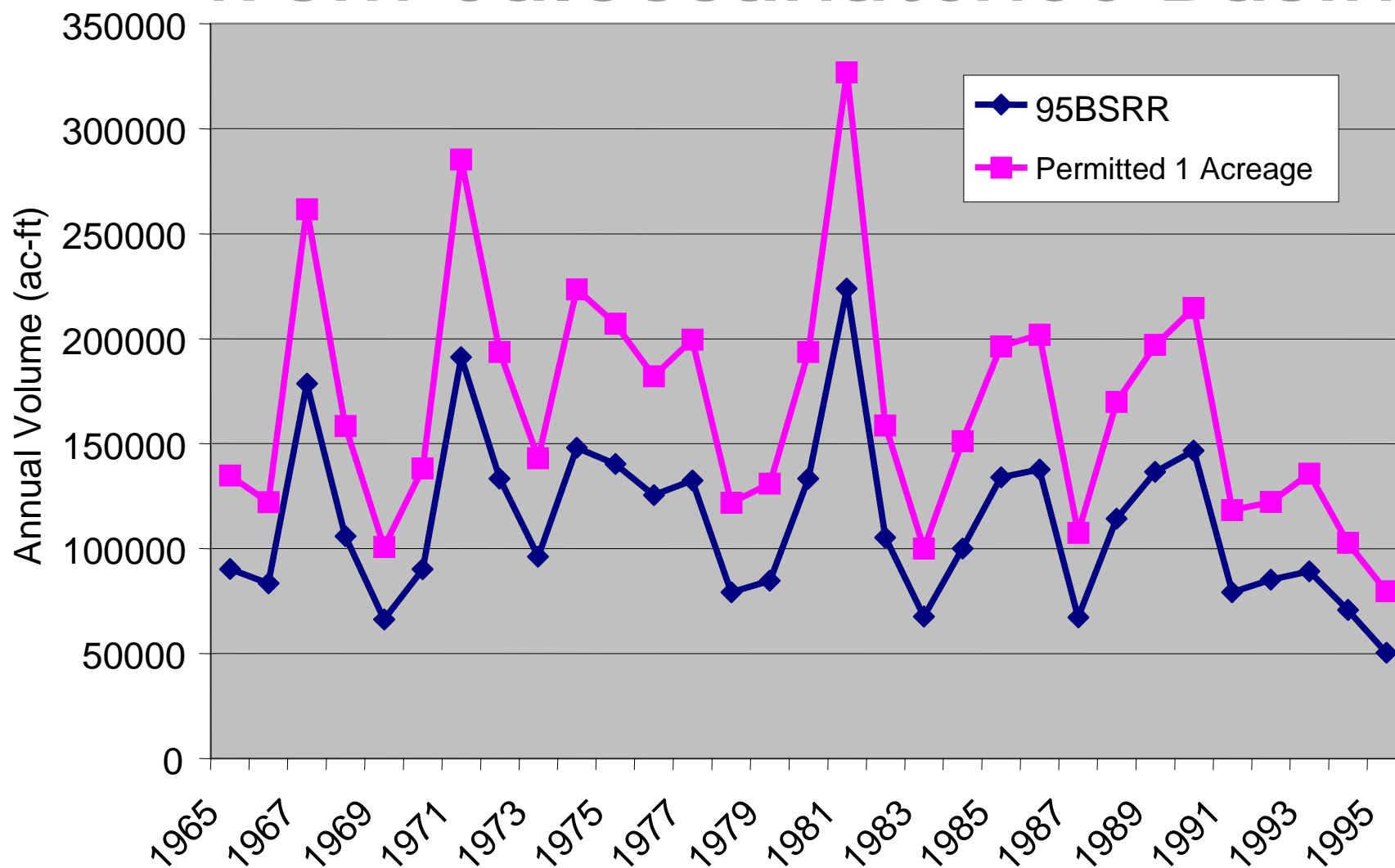
- 95BSRR: The same base condition used for the Lower East Coast Regional Water Supply Plan (Actual ag acreage & actual pumpage ~1995)
- Permitted 1: 95BSRR with permitted acreage of Caloosahatchee and lower Istokpoga basins
- Permitted 2: Permitted 1+permitted wellfield demands in LEC
- Authorized: Permitted 2+ “Authorized” projects (ECP, C-111, and ModWaters)

Caloosahatchee Basin Land Use Assumptions

	Citrus (ac)	Cane (ac)	Vegetable (ac)
LEC 95BSRR	64,492	36,157	8,809
"Permitted 1"	90,718	58,004	17,130
Change	26,226	21,847	8,321

- All new acreage assumed to replace non-irrigated pasture (no change in wetlands, upland forest or irrigated pasture)
- Growth in citrus acreage assumed to be micro-jet irrigated
- Sod farms included in Citrus category
- Overall, irrigated acreage increased by 51.5%
- **An average annual increase of 48.6% in LOK demand (from ~112.5 kac-ft/yr increased to ~167.0 kac-ft/yr)**

LOK Supplemental Demand from Caloosahatchee Basin

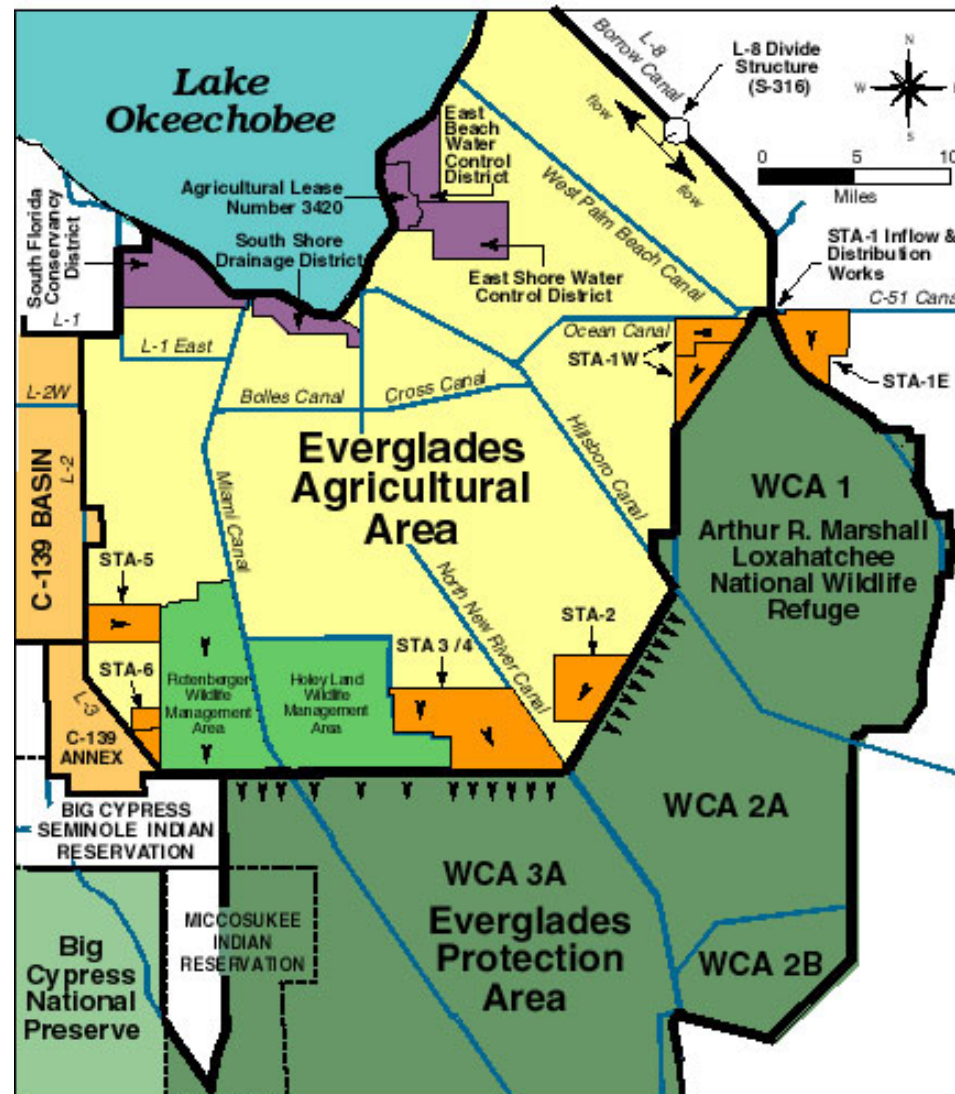


Wellfield Demands (~1995)

	95BSRR MGY (1000 ac-ft/yr)	PERMITTED 2 MGY (1000 ac-ft/yr)	Difference
NPB	12,456 (30)	18,745 (46)	+50%
SA-1	51,079 (125)	68,189 (167)	+33%
SA-2	86,475 (211)	104,760 (256)	+21%
SA-3	135,795 (332)	151,510 (370)	+12%
All SAs	285,805 (698)	343,204 (839)	+20 %

Authorized

Everglades Construction Project










Authorized

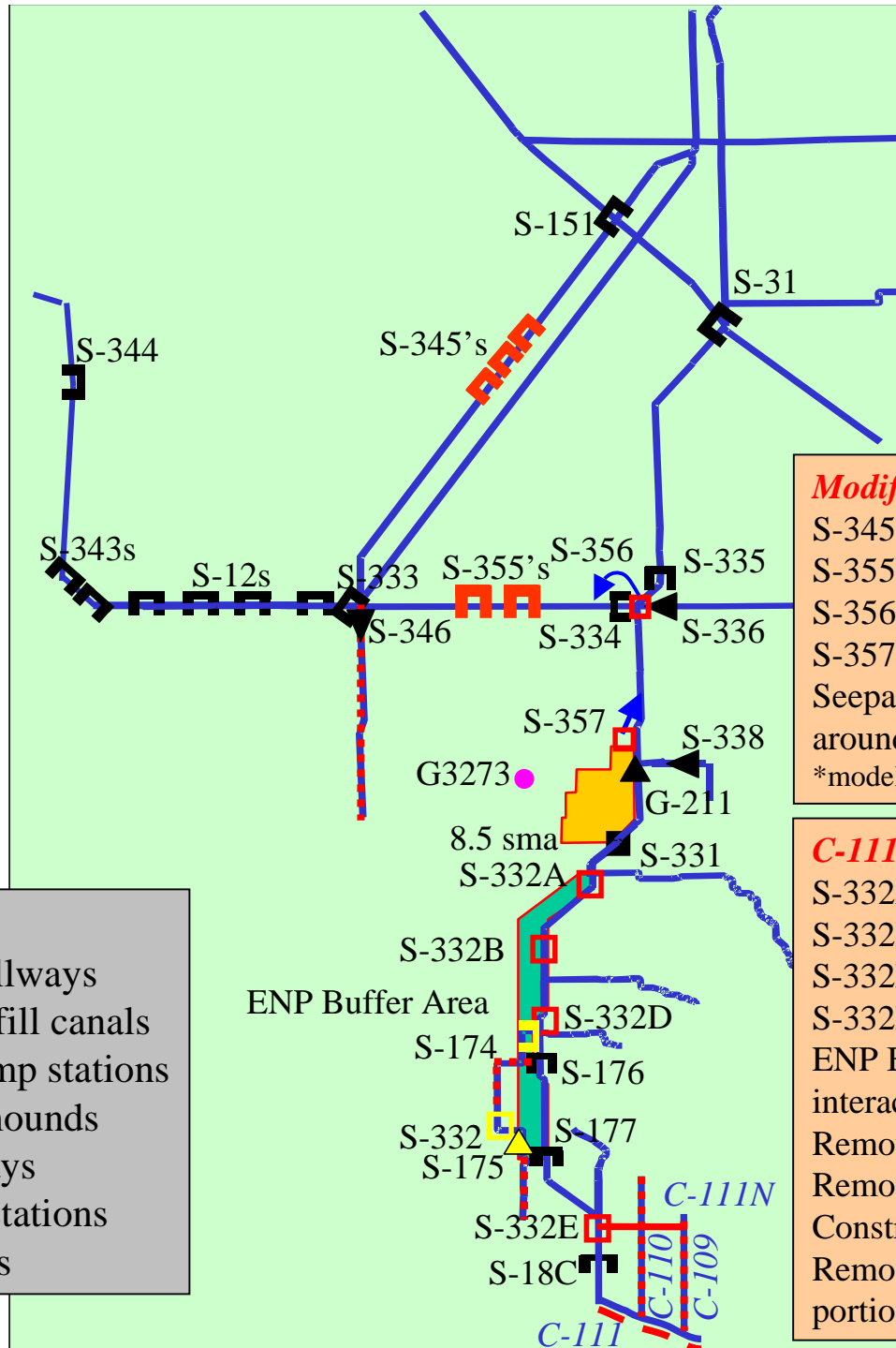
MWD to ENP and C-111 Projects

- No G3273 constraint on S-355 and S-333
- L-29 8.0' constraint on S-355 and S-356

Note: pre-IOP/ISOP assumptions

Proposed

-  Construction of spillways
-  Degrade levee and fill canals
-  Construction of pump stations
-  Removal of spoil mounds
-  Removal of spillways
-  Removal of pump stations
-  Removal of culverts



Modified Water Deliveries Project

- S-345's = 3 x 500 cfs*
- S-355's = 2 x 1000 cfs*
- S-356 = 900 cfs pumping to L-29
- S-357 = 400 cfs pumping to L-31N
- Seepage collector canal and levee around 8.5 sma
- *modeled as a single structure in 2x2

C-111 Project

- S-332A = 300 cfs
- S-332B = 400 cfs
- S-332D = 500 cfs
- S-332E = 50 cfs
- ENP Buffer Area-no overland flow interaction
- Removal of S-174, S-175, S-332
- Removal of C-109 and C-110
- Construction of C-111N
- Removal of spoil mounds on portion of C-111

Results:

Comparison of

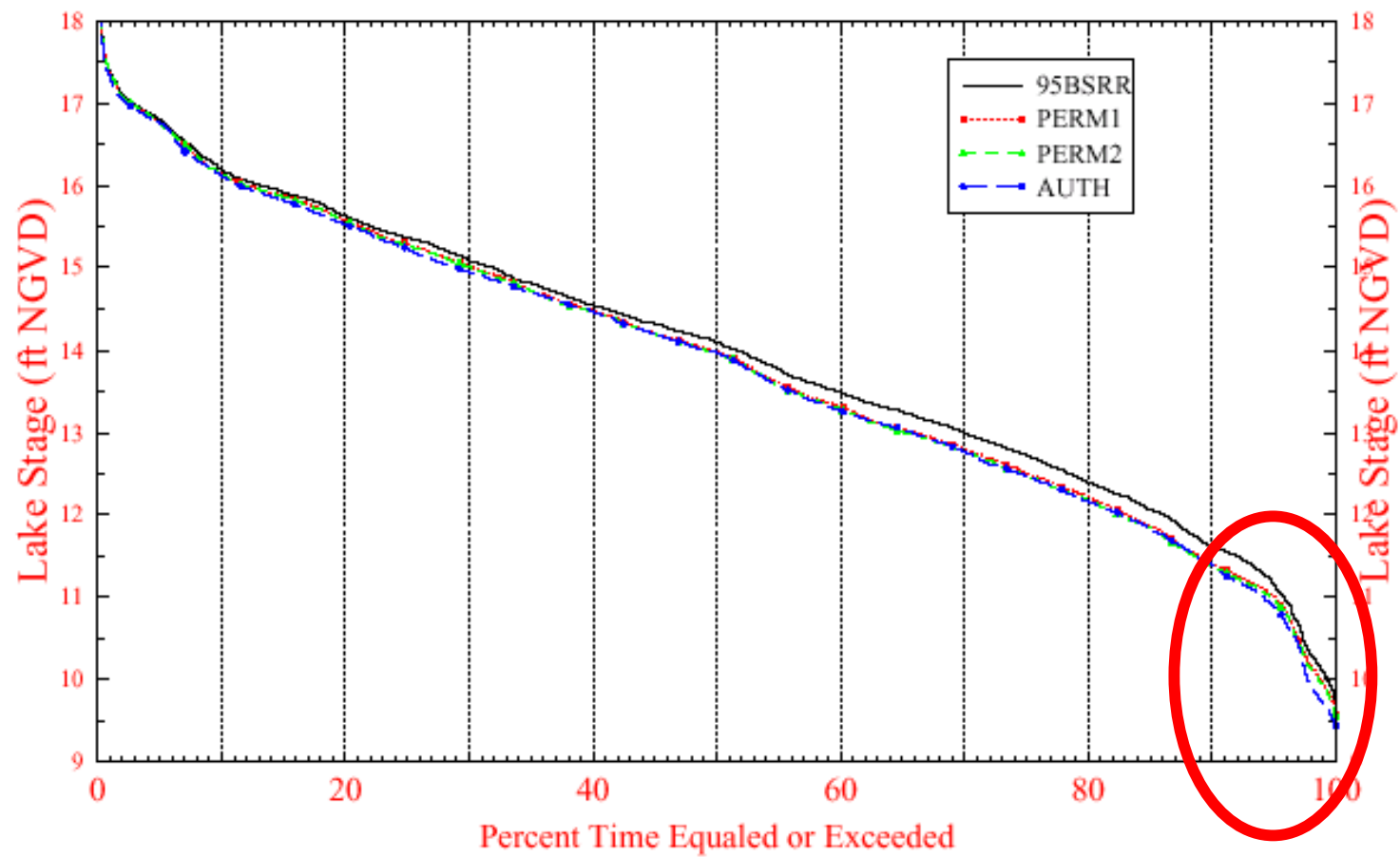
LEC 95BSRR Run

Permitted 1 Run

Permitted 2 Run

Authorized Run

Lake Okeechobee Stage Duration Curves



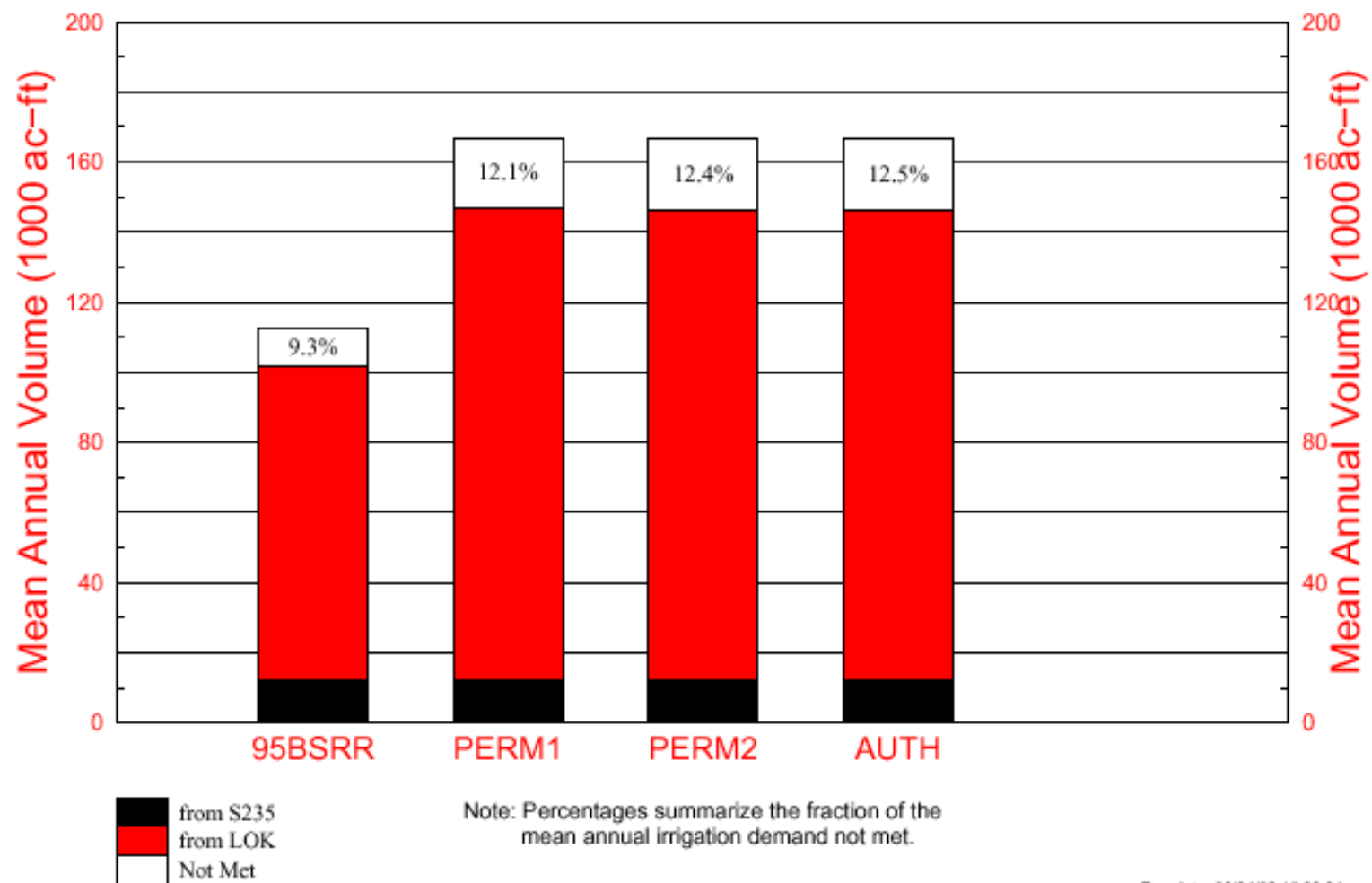
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SPWMM V3.7

Reduction in Oct 1st LOK Stage (Relative to 95BSRR Scenario)

	Scenario		
	Permitted 1	Permitted 2	Authorized
Mean	-0.12	-0.14	-0.18
Max	-0.33	-0.36	-0.40
Min	0.02	0.02	0.03

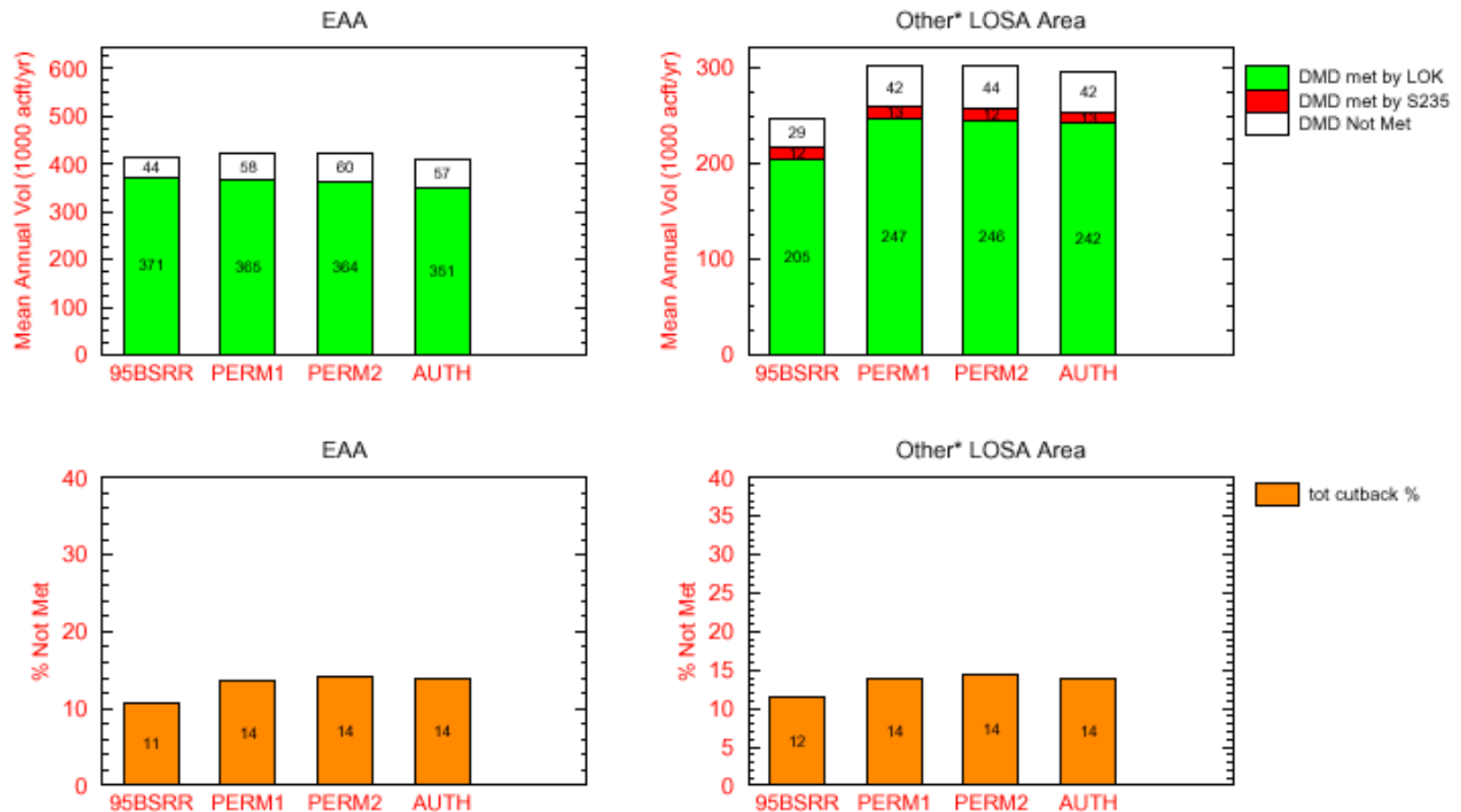
C43 Basin Regional Supplemental Irrigation Supply and Demand Not Met

Means for the 1965 to 1995 Simulation Period



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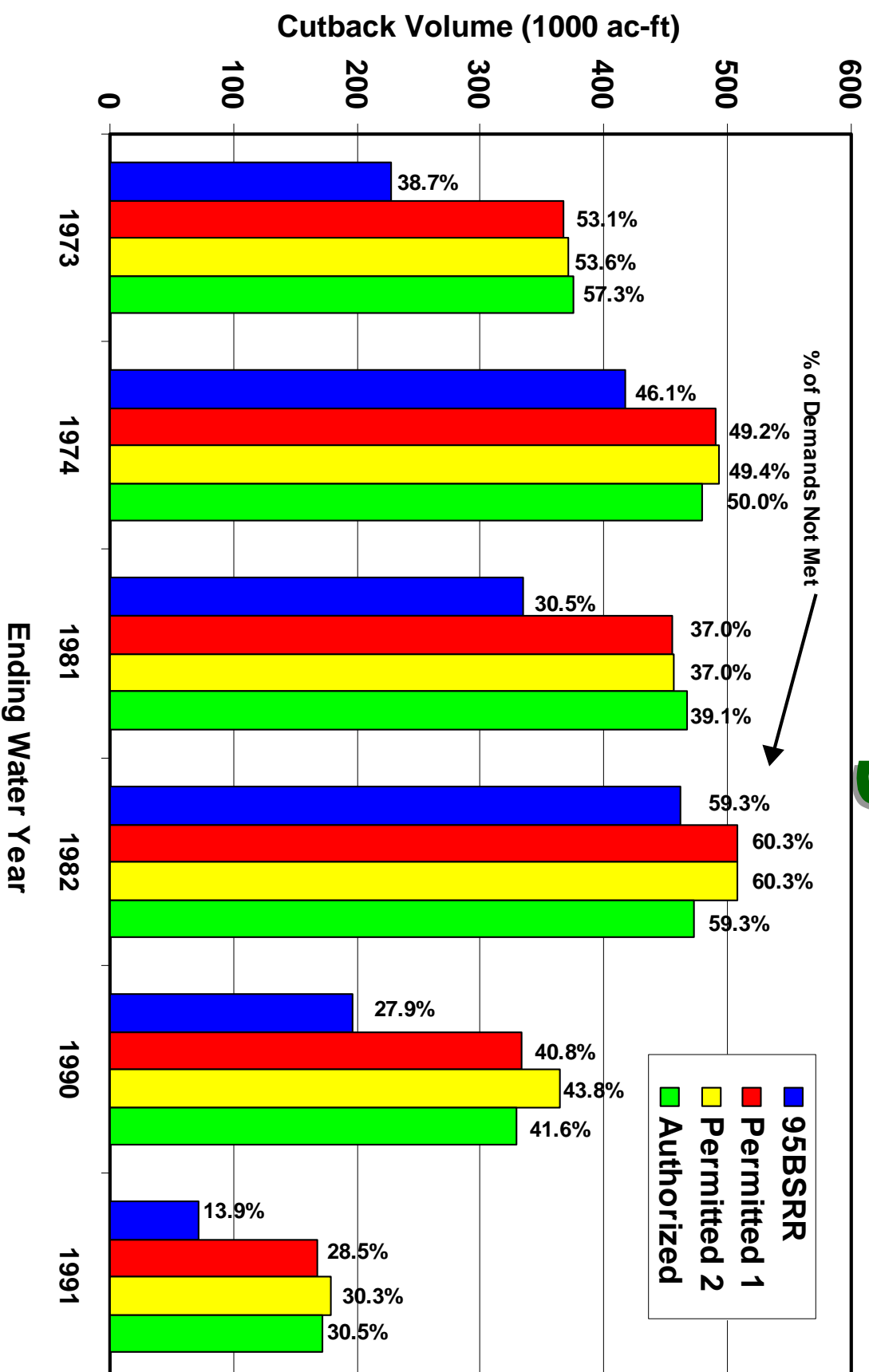
Mean Annual EAA/LOSA Supplemental Irrigation: Demands and Demands Not Met for the 1965 – 1995 Simulation Period



*Other Lake Service SubAreas (S236, S4, L8, C43, C44, and Seminole Indians (Brighton & Big Cypress)).

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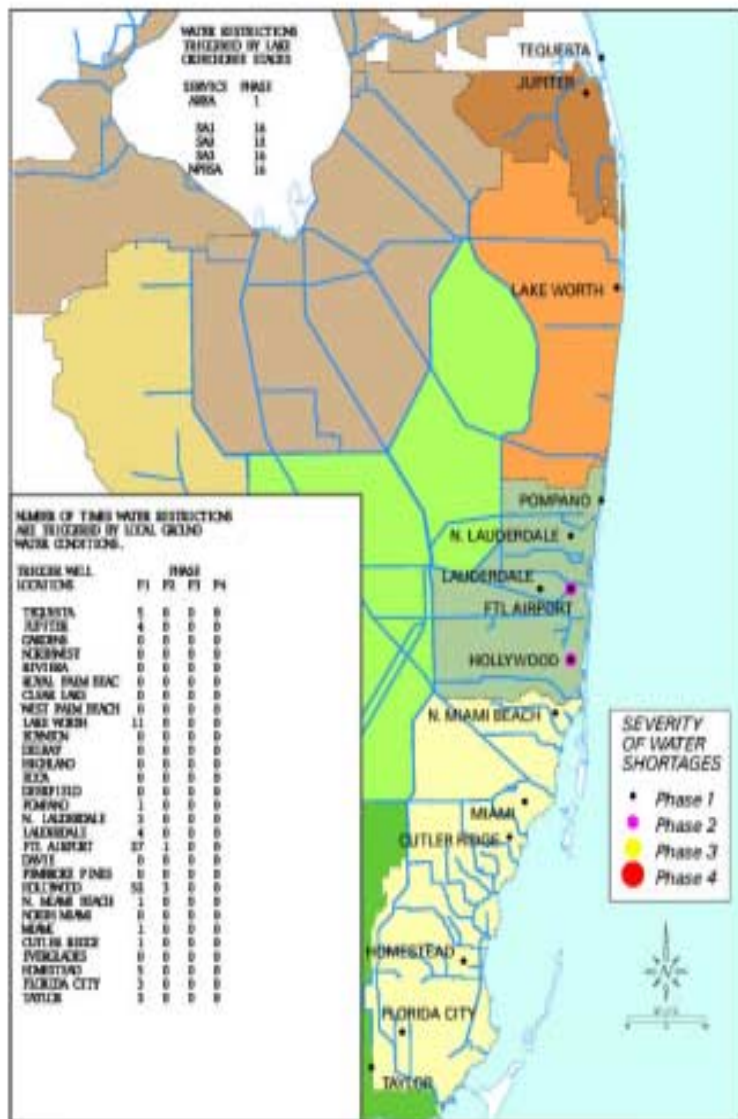
LOSA Cutbacks During Droughts



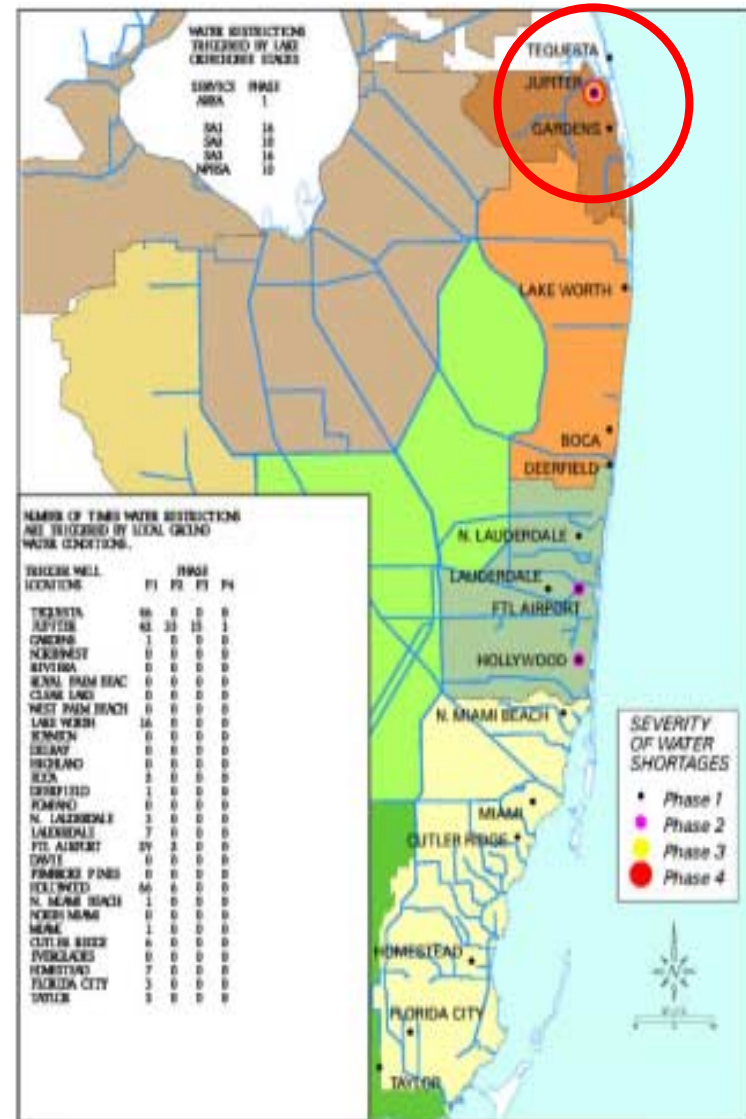
Water Restrictions in LEC

Serv. Area	Run	TOTAL MONTHS	PHASE				LOCAL TRIGGER	LAKE TRIGGER	DRY SEASON
			1	2	3	4			
SA-1	95BSRR	44	44	0	0	0	11	12	21
	PERM1	52	52	0	0	0	11	16	25
	PERM2	57	57	0	0	0	16	16	25
	AUTH	50	50	0	0	0	16	15	19
SA-2	95BSRR	89	86	3	0	0	56	9	24
	PERM1	93	90	3	0	0	55	12	26
	PERM2	110	104	6	0	0	72	10	28
	AUTH	107	102	5	0	0	73	9	25
SA-3	95BSRR	38	38	0	0	0	5	12	21
	PERM1	46	46	0	0	0	5	16	25
	PERM2	51	51	0	0	0	10	16	25
	AUTH	43	43	0	0	0	8	15	20
NPBCC	95BSRR	43	43	0	0	0	7	12	24
	PERM1	51	51	0	0	0	7	16	28
	PERM2	134	85	33	15	1	101	10	23
	AUTH	128	79	33	15	1	102	9	17

Note: The large increase in water restrictions in NPBC is due to the particular location of Jupiter wellfield. This issue has been resolved already.

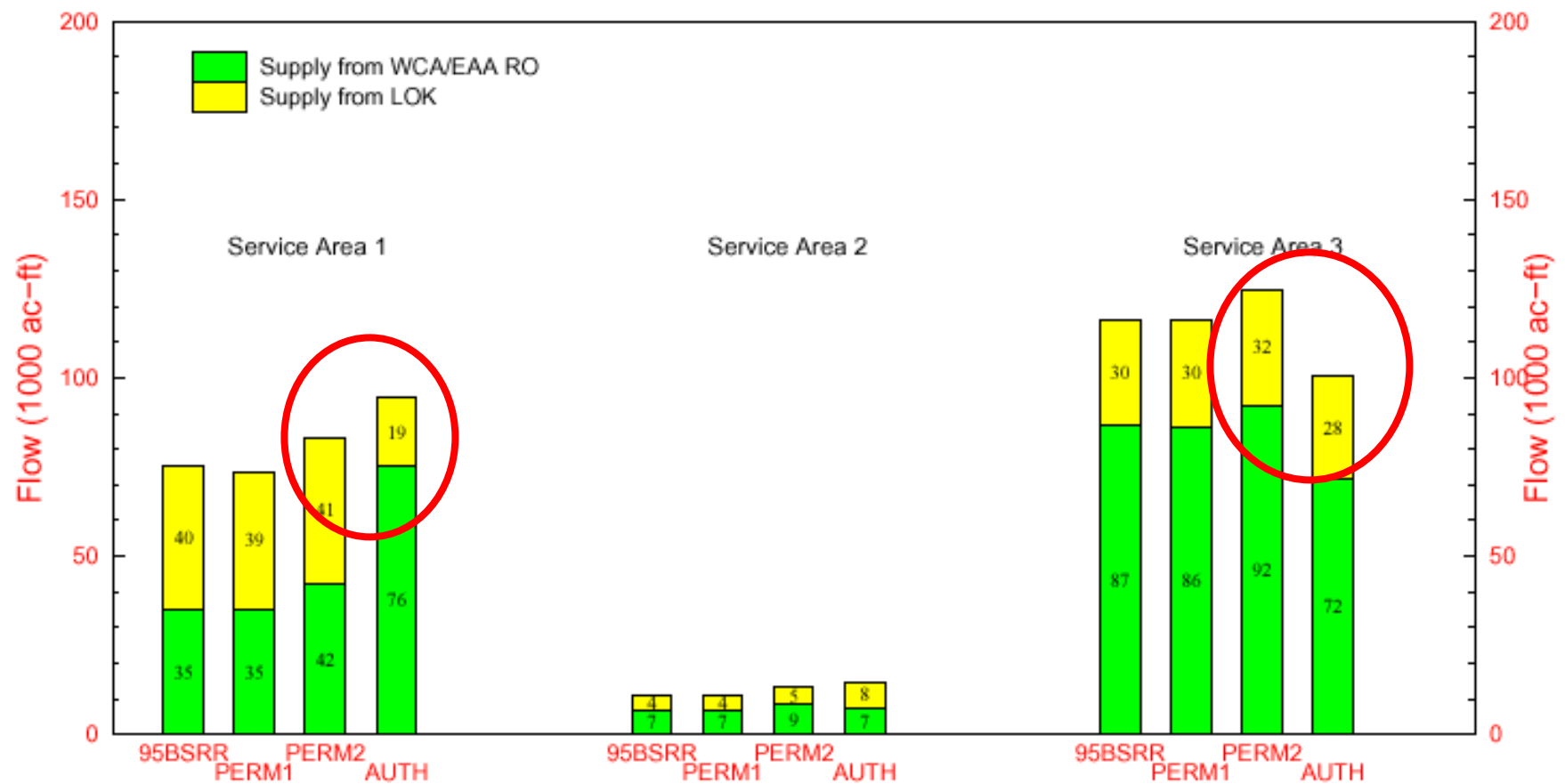


Frequency & Severity of Water Restriction Triggers for
'v3.7 - Permitted 1'



Frequency & Severity of Water Restriction Triggers for
'v3.7 - Permitted 2'

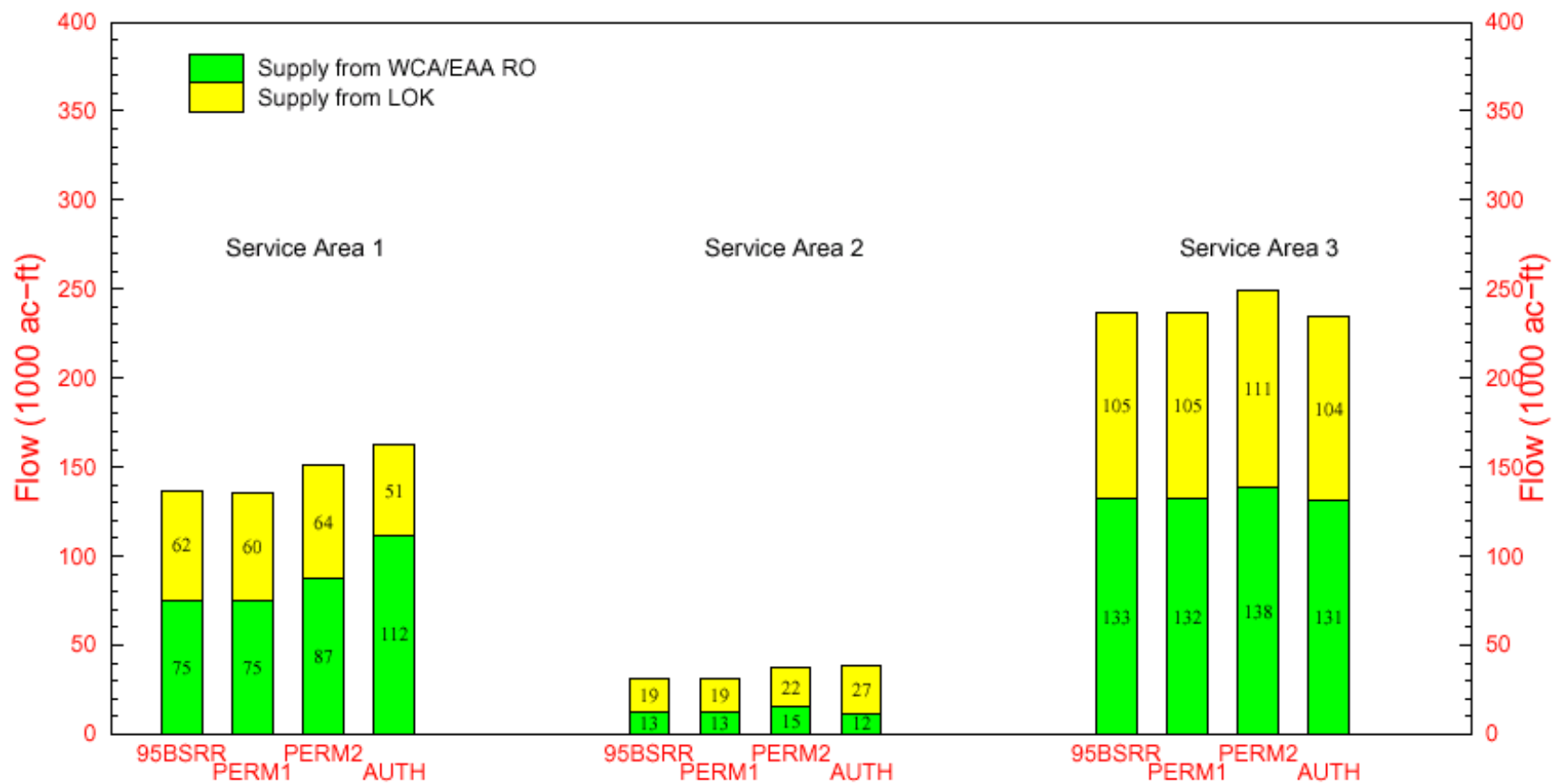
Average Annual Regional System Water Supply Deliveries to LEC Service Areas for the 1965 – 1995 simulation



Note: Supply RECEIVED from LOK may be less than what is DELIVERED at LOK due to conveyance constraints.
Regional System is comprised of LOK and WCAs.

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Mean Annual Regional System Water Supply Deliveries to LEC Service Areas for the five Drought years (71,75,81,85,89)



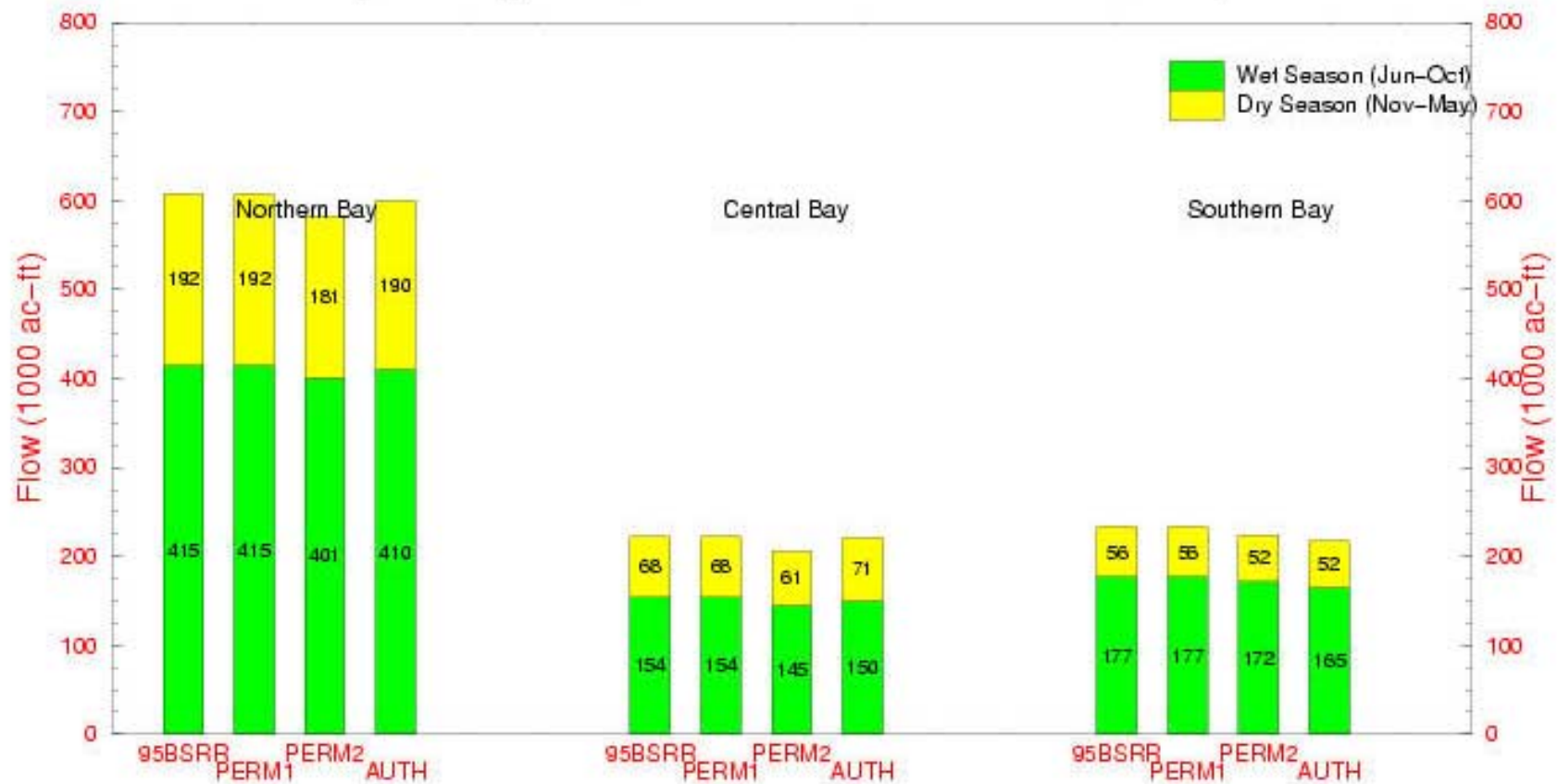
Note: Supply RECEIVED from LOK may be less than what is DELIVERED at LOK due to conveyance constraints.
Regional System is comprised of LOK and WCAs.

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Average Annual Ground Water & Levee Seepage Flow Contributions into the LECSA's for 1965 – 1995 Simulation Period



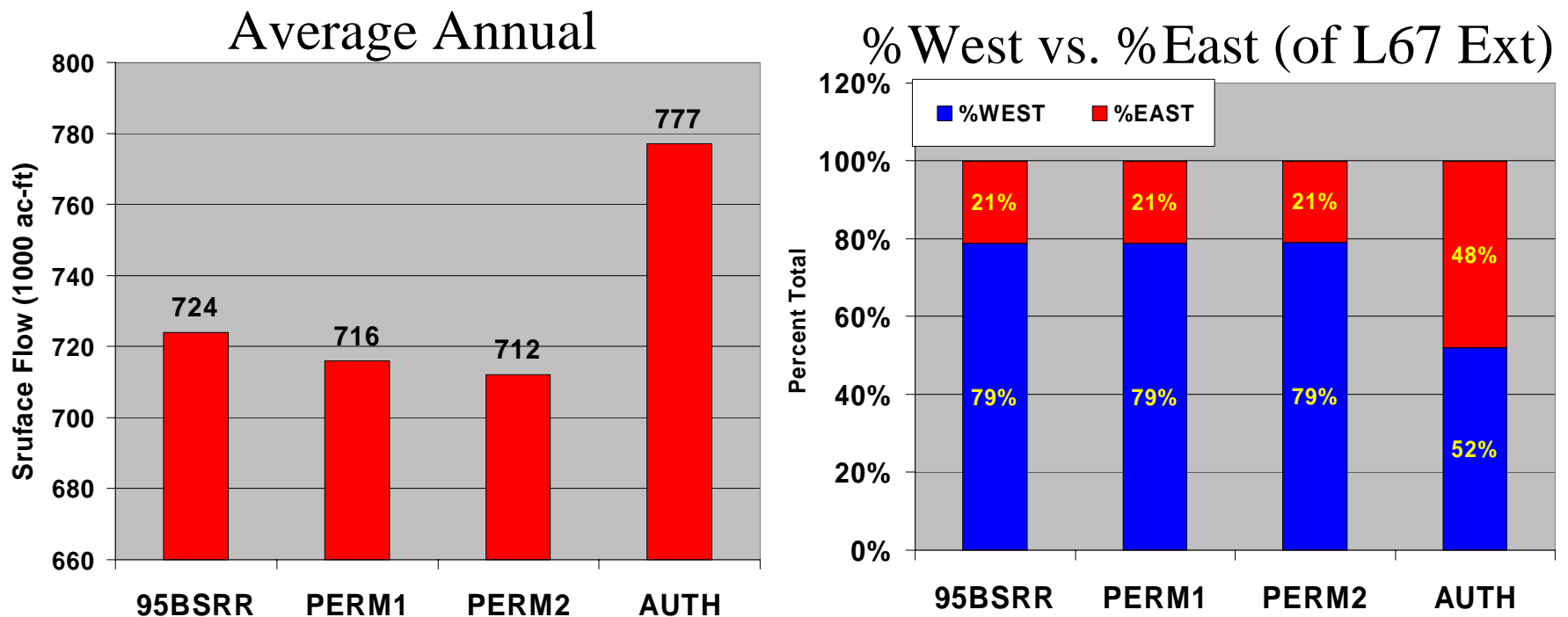
Mean Annual Surface Flows Discharged to North, Central & South Biscayne Bay for the 1965 – 1995 simulation period



Note: Simulated Structure flows: North Bay=S25+S25B+S26+S27+S28+S29; Central=S122+S123+S22+G34+S118; South=S20F+S20G+S21+S21A+S197

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Flows into ENP across Tamiami Trail



Mean NSM Hydroperiod Matches

	95BSRR	PERM1	PERM2	AUTH
WCA-1	68.4	68.4	70.2	80.7
WCA-2A	92.7	92.7	92.7	87.8
WCA-2B	54.5	45.5	45.5	45.5
WCA-3A North	42.5	43.7	43.7	43.7
WCA-3A South	67.3	67.3	67.3	64.6
WCA-3B	59.3	55.6	55.6	59.3
Holey Land	50.0	50.0	50.0	50.0
Rotenberger	7.7	7.7	7.7	61.5
Central Shark River Slough	52.5	52.5	52.5	54.2
Pennsuco	25.0	25.0	25.0	25.0
Everglades National Park	53.7	53.7	53.7	58.9
Remaining Glades	58.2	58.0	58.2	61.6
BCNP North	47.1	47.1	47.1	47.1
BCNP South	95.3	95.3	95.3	93.9
WCA System	63.5	63.2	63.5	64.1

Minimum Flows and Levels Exceedance

Area	Gage	Indicator Region	95BSRR	PERM 1	PERM 2	AUTH
Taylor Slough	NP-67	1	14	14	14	16
Mid-Perrine Marl Marsh	G-1251	3	16	16	16	21
Rockland Marl Marsh	G-1502	8	28	28	28	27
SW Shark River Slough	NP-36	9	10	10	10	10
Mid Shark River Slough	NP-33	10	9	9	9	10
NE Shark River Slough	NESRS-2	11	10	10	11	8
New Shark River Slough	NP-201	12	9	9	9	9
South WCA-3A	3A-28	14	0	0	0	0
East WCA-3B	3B-SE	16	10	10	10	8
South Central WCA-3A	3A-4	17	6	6	6	6
North Central WCA-3A	3A-S	18	9	9	9	9
NW WCA-3A	3A-28	20	15	16	16	14
NE WCA-3A	3A-NE	21	19	19	20	17
NW Corner WCA-3A	3A-NW	22	22	22	22	17
WCA-2B	2B-Cent	23	11	11	11	13
South WCA-2A	2A-17	24	9	9	9	12
North LNWR (WCA-1)	1-7	27	2	2	2	6
Rotenberger WMA	ROTTS	28	26	26	26	22
Holey Land WMA	HOLEY-	29	6	6	6	5
Cape Sable Sparrow A	NP-34	46	16	16	16	18
S of NE WCA-3A	3A-3	68	6	6	6	6
Eastern Edge of SRS	NP-38	70	21	21	21	20

Summary of Results

- **Permitted 1** (Permitted acreage in Caloos.+lower Istok.):
 - ~50% increase in regional water supply demand on Lake Okeechobee from Caloosahatchee Basin
 - Decrease in LOK stages up to 0.33 ft with an average reduction of about 0.12 ft.
 - Increase in water shortage cutbacks in Lake Service Areas particularly during major droughts
 - Increased water shortage cutbacks in LEC Urban Area triggered by lower LOK stages
 - No significant effect on Remnant Everglades except for slight decrease in flows into ENP

Summary of Results (cont.)

- **Permitted 2** (Permitted wellfield demands in LEC):
 - No significant decrease in LOK stages
 - No significant effect on Lake Service Area
 - Increase in water shortage cutbacks in LEC urban area due to local triggers
 - Simulated occurrence of Phase II, Phase III, and even Phase IV water restrictions in North Palm Beach Service area (caused by permitted pumpage in Jupiter which has been resolved recently)
 - Increased dependence on regional system by LEC service areas
 - Slight decrease in flows to ENP and Biscayne Bay

Summary of Results (cont.)

- **Authorized** (Authorized Projects, ECP, C-111,MODW):
 - No significant decrease in LOK stages
 - No significant effect on Lake Service Area
 - Increased regional system deliveries to SA-1
 - Increased seepage from Glades into SA-3
 - Decreased regional system deliveries to SA-3
 - Increased water levels in eastern sections of ENP
 - Increase in deliveries into ENP across Tamiami Trail;
Larger percentage into ENP east of L-67 extension
 - Increased hydroperiod matches in ENP

Questions?



LOK Demands simulated in LEC runs for meeting Brighton Seminole Indian Reservation Entitlement

